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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,771	11/27/2001	Yoshiaki Hasegawa	0819-0703	7630

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NIXON PEABODY, LLP  
8180 GREENSBORO DRIVE  
SUITE 800  
MCLEAN, VA 22102

EXAMINER
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MULPURI, SAVITRI

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 12/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No. <b>09/993,771</b>	Applicant(s) <b>Hasegawa et al</b>
Examiner <b>Savitri Mulpuri</b>	Art Unit <b>2812</b>

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

1)  Responsive to communication(s) filed on Nov 27, 2001.

2a)  This action is FINAL.      2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

### Disposition of Claims

4)  Claim(s) 1-13 is/are pending in the application.

4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1-13 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are a)  accepted or b)  objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)  The proposed drawing correction filed on \_\_\_\_\_ is: a)  approved b)  disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.

12)  The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

13)  Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)  All b)  Some\* c)  None of:

1.  Certified copies of the priority documents have been received.
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\*See the attached detailed Office action for a list of the certified copies not received.

14)  Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a)  The translation of the foreign language provisional application has been received.

15)  Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

1)  Notice of References Cited (PTO-892)

2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)  Information Disclosure Statement(s) (PTO-1449) Paper No(s). 7

4)  Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_

5)  Notice of Informal Patent Application (PTO-152)

6)  Other: \_\_\_\_\_

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## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

Claims 10-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not understood how third step of performing a dry etching process on the semiconductor layer performed before second step, which is forming second conductive layer (refer base claim 1). Correction is requested.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371 of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35

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U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-3, 6, 8, 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakamura et al (US 2002/0167018 A).

Nakamura et al discloses a method of making laser device with GaN based compound semiconductor materials: Providing a substrate forming multiple GaN based layers "4-8" to form active region for laser device; growing first magnesium doped p- AlGaN layer "17" with aluminum content of 0.2 as an etch stop layer and then growing second AlGaN layer "12" with aluminum content of 0.1; etching the second AlGaN layer until etch stop first AlGaN layer is exposed. Nakamura clearly mention that more aluminum content reduces the etching rate of first AlGaN layer.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4,5,~~7~~<sup>9</sup> are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al in combination with Ono et al (US 5757835).

Nakamura do et al not disclose silicon doped AlGaN as an etch stop layer. However, selecting type of dopant such silicon as n-type element in etch stop layer would have been with the choice of one ordinary skill in the art depending on the type of the selecting the type first cladding

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layer and first guiding layer and second cladding and second guide layer and current blocking layer "12". Nakamura exemplified with first cladding and first guide layer "4, 5" and current block AlGaN layer "12" are n-type (silicon doped). If Nakamura had chosen p-type GaN layers are 4, 5, 12, then AlGaN etch stop layer would be n-type i.e., silicon doped AlGaN layer.

Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. In combination with Chen et al.

Nakamura et al does not teach using laser for photoluminescence or x-ray fro diffraction for detecting the etch stop layer to see wether etch stop layer is exposed or not.

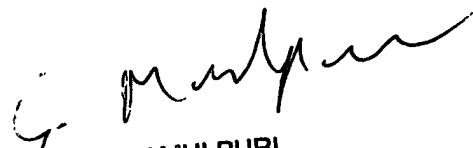
Chen et al teaches GaN based compound semiconductor layer perform dry etching with BCl<sub>3</sub> or Ar gas and then detecting etched surface with laser for photoluminescence and x-ray diffraction (see the document). It would have been obvious and routine to perform in the invention of Nakamura, photoluminescence and x-diffracton on the etched AlGaN layer for the characterizing the materials for optical electrical properties of the etched surface.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shakuda (US 5,583,880) first layer upper cladding layer "4" and current blocking layer "5" and Shakuda (US 6238947) teach first cladding AlGaN with high Al content as etch stop layer "6" and second current block layer "7" . Yang et al teaches X-diffraction and PL measurements. Ballato teaches X-diffraction with etching apparatus.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Mulpuri whose telephone number is 703-305-5184. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



SAVITRI MULPURI  
PRIMARY EXAMINER